

# Psychological Hardiness and Coping Style as Risk/Resilience Factors for Alcohol Abuse

COL Paul T. Bartone, MS USA (Ret.)\*; Sigurd W. Hystad, PhD†; Commander Jarle Eid, Navy Medical Services Corps‡; John I. Brevik, MD‡

**ABSTRACT** Alcohol abuse is a growing problem in the military, and a costly one. The present study evaluates the potential role of psychological hardiness, an individual resilience resource, to stress-related problem drinking in a military population. We assess the association of psychological hardiness and avoidance coping style with alcohol use patterns in a large national sample of Norwegian military defense personnel. Results show that low hardiness and high avoidance coping are significant predictors of alcohol abuse. Also, the challenge facet of hardiness predicts risk of alcohol abuse among respondents with recent deployment experience, and this effect is greater for those with harsh deployment experiences. Older defense workers are also at higher risk, suggesting cumulative occupational stress may take a toll. This research indicates that hardiness and avoidance coping measures may serve as useful adjunct screening tools for alcohol abuse in the military.

## INTRODUCTION

Alcohol and drug abuse is a growing problem among military personnel returning from overseas deployments, one which greatly complicates and in many cases prevents full health recovery. For example, a recent Veterans Administration study found that substance abuse and post-traumatic stress disorder (PTSD) are the most common health problems among American veterans of Iraq and Afghanistan seeking care in Veterans Administration facilities.<sup>1</sup> And while substance abuse can be a problem for any military service member, the risk increases with exposure to stressful conditions. Research shows that military members who have experienced more extreme combat exposure, more frequent deployments, and combat-related wounds are at higher risk for a range of mental health problems.<sup>2</sup> Studies have also found that combat-deployed soldiers are at higher risk for new-onset heavy and binge drinking, and a range of alcohol-related problems after they return home, and that these risks are even higher for Reserve and National Guard troops.<sup>3</sup> This research also reports that younger troops are at higher risk for alcohol abuse, a finding seen also in large-scale population surveys of U.S. active duty personnel.<sup>4,5</sup>

Despite these disturbing trends, it is still true that most deployed and combat-exposed troops do not develop stress-related problems, to include alcohol and substance abuse. In fact, the majority of exposed service members cope and

adjust quite well. What accounts for these individual differences in vulnerability to stress-related alcohol and substance abuse? One possible explanation lies in the psychological qualities summarized as hardiness. Hardiness was first described by Kobasa as a set of related personality tendencies or traits that distinguished executives who remained healthy under severe job stress from those who fell ill.<sup>6</sup> These qualities are summarized as: commitment, an abiding conviction that life is interesting and worth living; control, the belief that one can control or influence outcomes; and challenge, an adventurous, exploring approach to living. Although sometimes described as attitudes,<sup>7</sup> mental hardiness is better understood as a broadly encompassing personal style or approach to life, a generalized mode of functioning marked by commitment, control, and challenge.<sup>8</sup> In the terminology of Alfred Adler,<sup>9</sup> hardiness can be considered a “style of life” which incorporates one’s self-concept, world view, and fundamental mode of dealing with life situations. Because the hardy style of life is associated with resilience under stress, it has been described as the “hardy-resilient style.”<sup>8</sup> In addition to commitment, control, and challenge, the hardy-resilient style person shows a strong future orientation, a tendency to look optimistically to the future while learning from the past. Further, the hardy-resilient person is courageous in the face of new experiences as well as disappointments, is action-oriented, competent, and has a good sense of humor.<sup>10</sup>

Since 1979, an extensive body of research has accumulated showing that psychological hardiness protects against the ill-effects of stress on health and performance.<sup>11</sup> Research studies with a variety of occupational groups have found that hardiness operates as a significant moderator or buffer of stress.<sup>12–16</sup> Hardiness has also been identified as a moderator of combat exposure stress in U.S. Gulf War soldiers.<sup>17,18</sup> For example, Bartone<sup>19</sup> found that combat-exposed Gulf War soldiers who were low in hardiness were at significantly higher risk for PTSD symptoms. Other studies have found

\*Center for Technology & National Security Policy, National Defense University, Fort Lesley J. McNair, 300 5th Avenue SW, Washington, DC 20319.

†Department of Psychosocial Science, University of Bergen, Christiesgate 12, 5015 Bergen, Norway.

‡Norwegian Defence Medical Services, P.O. Box 800, N-2617 Lillehammer, Norway.

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similar effects.<sup>20</sup> Hardiness has appeared as a stress buffer in other military groups as well, including U.S. Army casualty assistance workers,<sup>21</sup> peacekeeping soldiers,<sup>22,23</sup> Israeli soldiers in combat training,<sup>24</sup> Israeli officer candidates,<sup>25</sup> and Norwegian Navy cadets.<sup>26</sup> High hardy persons are not impervious to the ill-effects of stress, but they do not show the same level of stress-related symptoms and performance decrements as low-hardy persons.

Additionally, there is evidence pointing to the cross-cultural validity of the hardy-resilient style. For instance, the theoretical structure of three facets (commitment, control, and challenge) nested beneath a superordinate hardiness construct has been supported by confirmatory factor analyses in different cultures.<sup>27,28</sup> Moreover, in a review of the relevant studies addressing the issue of hardiness across cultures, Maddi and Harvey<sup>29</sup> conclude that available evidence shows little or no cultural differences in the role of hardiness and suggest that hardiness appears to be a factor in resilience under stress across cultures.

The health effects of hardiness appear to be at least partly the result of the different kinds of coping strategies and behaviors favored by high versus low-hardy persons. It is known that low-hardiness individuals tend to rely on negative, avoidance coping strategies in responding to stress,<sup>30,31</sup> strategies which could include excessive alcohol consumption or drug abuse. In one study examining the relationship of hardiness to alcohol and illicit drug use in college students, Maddi et al<sup>32</sup> found that students low in hardiness consumed more alcohol, and also that low hardiness was associated with marijuana and cocaine use as indicated both by self-report and urinalysis results. On the other hand, those high in hardiness tend to rely on problem-focused, active coping approaches for dealing with stressful conditions. People high in hardiness and the sense of control are more likely to form positive outcome expectancies in response to stress (positive coping), whereas low-hardiness people tend toward negative outcome expectancies (hopelessness or helplessness).<sup>33</sup>

Thus, persons low in hardiness may be more likely to use avoidance or regressive coping approaches in response to stress, including substance and alcohol abuse. Considering this, it seems possible that military personnel who are low in hardiness are at elevated risk for substance abuse problems. This study will specifically test the hypothesis that military personnel who are low in psychological hardiness are more likely to engage in stress-related alcohol abuse.

## METHODS

### *Participants and Procedure*

The data for this study were obtained from the National Defence Health Survey (NDHS) administered by the Norwegian Armed Forces Health Registry (hereafter referred to as the "Health Registry"). The Health Registry is a national register administered by the Norwegian Ministry of Defence and was established by the Norwegian Parliament in response

to public concern after soldiers reported symptoms of the so-called "Gulf War Syndrome." The purpose of the Health Registry is to aggregate health data, environmental information, and military service data in order, among other things, to promote research that seeks to increase knowledge about the health of Armed Forces personnel. The Health Registry project maintains strict procedures for handling sensitive and identifiable personal information, and has been approved by the Norwegian Data Inspectorate.

The NDHS is a comprehensive health survey that is administered annually to all members of the Norwegian Defence Forces, including officer and enlisted, active duty and reserve, uniformed and civilian. Participation is voluntary, and employees give their consent that their responses may be used for research purposes. A standard set of demographic, health behavior, and outcome measures are repeated in the NDHS each year. Similar surveys are done in the United States, but there is a higher level of turnover among American military personnel, making it more difficult to draw inferences about possible causal effects.<sup>5</sup>

For the present study, hardiness was measured in the 2007 annual survey. The 2007 survey was distributed to 15,410 employees and a total of 7,555 completed questionnaires were returned, for a response rate of 49.3%. Similar high response rates are found in other NDHS surveys. All other measures were collected in 2010, including questions relating to alcohol use (e.g., CAGE, see description of survey instruments below). This allows for a prospective test of the primary hypothesis of the present study, namely that low levels of hardiness are predictive of regressive stress coping patterns expressed in terms of alcohol abuse. From the total sample of respondents to the 2010 NDHS, 1,402 (94% men) indicated whether or not they had been deployed at some time during the past 3 years. All subsequent analyses were restricted to this group. The age distribution of the sample was as follows: 16.2% were under 29 years; 35.7% were between 30 and 39 years; 36.6% were between 40 and 49 years; and 11.6% were older than 50 years.

### *Survey Instruments*

Hardiness was measured with the DRS-15R (Dispositional Resilience Scale), a short, valid and reliable instrument that has been developed and refined over 25 years.<sup>12,34</sup> The DRS-15 consists of five items each to measure the control, commitment, and challenge dimensions of hardiness and is scored on a four-point scale (0 = Not at all true, 3 = Completely true). An example item is: "Most of my life gets spent doing things that are meaningful." The DRS has been used extensively in both military and non-military samples, with excellent results.<sup>21,35,36</sup> In an early critical review of hardiness theory and research, Funk<sup>30</sup> recommended the DRS as the best available instrument to measure hardiness. Also using the DRS, Sinclair and Tetric<sup>28</sup> confirmed a factor structure of three facets, commitment, control, and challenge, nested under a more general hardiness construct. An updated Norwegian

adaption of the DRS-15 was used in the present study.<sup>27</sup> In a recent study with 213 undergraduate students, this scale predicted health under academic stress and demonstrated an overall internal consistency (Cronbach's  $\alpha$ ) of 0.71.<sup>37</sup>

Avoidance coping was measured with the 10-item avoidance coping subscale drawn from the Coping Style Questionnaire (CSQ).<sup>38</sup> The CSQ relates to participants' general coping style, as opposed to coping with a specific event. Respondents rate coping on a 4-point scale (1 = not at all; to 4 = all the time; response options 2 and 3 are unlabeled in the survey) on three dimensions; task-focused coping, emotion-focused coping, and avoidance-focused coping. A psychometric evaluation of the Norwegian version of the CSQ has demonstrated acceptable test-retest and internal consistency coefficients.<sup>39</sup> An example of an item from the avoidance coping dimensions is: "I wish the situation would end or just go away."

Alcohol use patterns were measured with the four-item self-report instrument CAGE.<sup>40</sup> The CAGE (Cut down, Annoyed, Guilty, Eye-opener) is an easy to use scale designed as a screening instrument for harmful drinking and alcoholism. Respondents indicate agreement (yes or no) to four simple questions: Have you ever: (1) felt the need to cut down your drinking; (2) felt annoyed by criticism of your drinking; (3) had guilty feelings about drinking; and (4) taken a morning eye opener? (In the Norwegian translation of CAGE items, it was necessary to adjust the wording slightly in order to preserve the original meaning of these items.) Previous research with this instrument has shown that a CAGE score of one is associated with a 46% probability of alcohol abuse or dependence, and CAGE scores of two or more are associated with more than 72% probability of alcohol dependence.<sup>41</sup> Consistent with conventions, we defined CAGE scores of one as being "at risk" for alcohol abuse, and scores of two or more as indicative of "current alcohol problems." All of the above-named instruments have been used extensively, and have shown acceptable levels of validity and reliability.

### Experience During Service

The 2010 NDHS included 17 items relating to experiences and situations encountered during deployment. To arrive at

measures for use in subsequent analyses, we performed an exploratory factor analysis on these items using principal axis factoring. The exploratory factor analysis revealed four factors with eigenvalues exceeding one, which together explained 52.1% of the variance. We then proceeded to extract four factors with oblique rotation. The rotated factor solution resulted in two factors that could meaningfully be interpreted as "combat exposure" and "deprivation of basic needs," with each factor containing five items with factor loadings in the range 0.41–0.82 (see Table I).

As can be seen from Table I, the "combat exposure" scale consisted of items asking about stressful and potentially lethal experiences during deployment (e.g., "Were you or your team ever involved in direct combat involving open fire?"). The "deprivation of basic needs" scale consisted of questions inquiring about the fulfillment of personal and basic needs during deployment (e.g., "Was it possible to rest adequately between each mission?").

All of the stress items were scored on a five-point scale (1 = very often; 2 = often; 3 = sometimes; 4 = rarely; 5 = never). To compute scale scores, items belonging to the combat exposure factor were reverse scored and summed into a composite scale score where high scores reflect high levels of stress (Cronbach's  $\alpha$  = 0.83). Items in the deprivation of basic needs factor were summed into a total composite score, where high scores represent high levels of deprivation (Cronbach's  $\alpha$  = 0.82).

### Demographics

In addition to the instruments mentioned above, the current study included information about the sex of participants, age group (29 years or younger; 30–39 years; 40–49 years; and 50 years or older), and if deployed, total length of deployment during the past 3 years (up to 6 months and more than 6 months).

### Statistical Analyses

The contributions of psychological hardiness to risk and current problems of alcohol abuse were assessed using logistic regression models that controlled for other influences,

**TABLE I.** Measures of Combat Exposure and Deprivation of Basic Needs Obtained From Exploratory Factor Analyses ( $N = 1402$ )

Experiences During Deployment	Factor Loadings
Combat Exposure (Cronbach's $\alpha$ = 0.83)	
1. Were you or your team ever involved in direct combat involving open fire?	0.79
2. Did you ever threaten anyone with your weapon during deployment?	0.76
3. Was your unit ever subject to threats involving weapons or violence?	0.66
4. Did you ever witness any death caused by the conflict?	0.61
5. Were you ever afraid of being killed or injured during deployment?	0.41
Deprivation of Basic Needs (Cronbach's $\alpha$ = 0.82)	
1. Was it possible to be rested before and after the leave-period?	0.82
2. Did you have the opportunity to withdraw and be by yourself as much as you needed?	0.78
3. Was it possible to rest adequately between each mission?	0.72
4. Was it possible to be rested during the leave-period?	0.72
5. Did you get sufficient privacy?	0.68

including age, sex, out-of-country deployments, and combat exposure and deprivation of basic needs. To explore potential interactions between hardiness and experiences during deployment, cross-product terms of hardiness and combat exposure and hardiness and basic needs were computed and entered into the regression models. All analyses were conducted using the Statistical Package for the Social Sciences version 19.

Potential interactions between hardiness and variables such as sex, age, and stress exposure were also evaluated by computing cross-product terms of hardiness and the relevant variables.

## RESULTS

Figure 1 shows the distribution of alcohol patterns among military personnel deployed (panel a) and personnel not deployed during the past 3 years (panel b). Among the deployed group, 1.9% showed CAGE scores indicating a current problem level of drinking (score of 2 or more), and 5.7% can be said to be "at risk" (score of 1). The non-deployed group showed a similar pattern, with slightly

lower numbers of problem level drinkers (1.7%) and at-risk drinkers (5.3%). These differences between the deployed and nondeployed groups were not statistically significant ( $\chi^2 [2, N = 1369] = 0.229, p = 0.89$ ).

### Predicting Risk for Alcohol Abuse

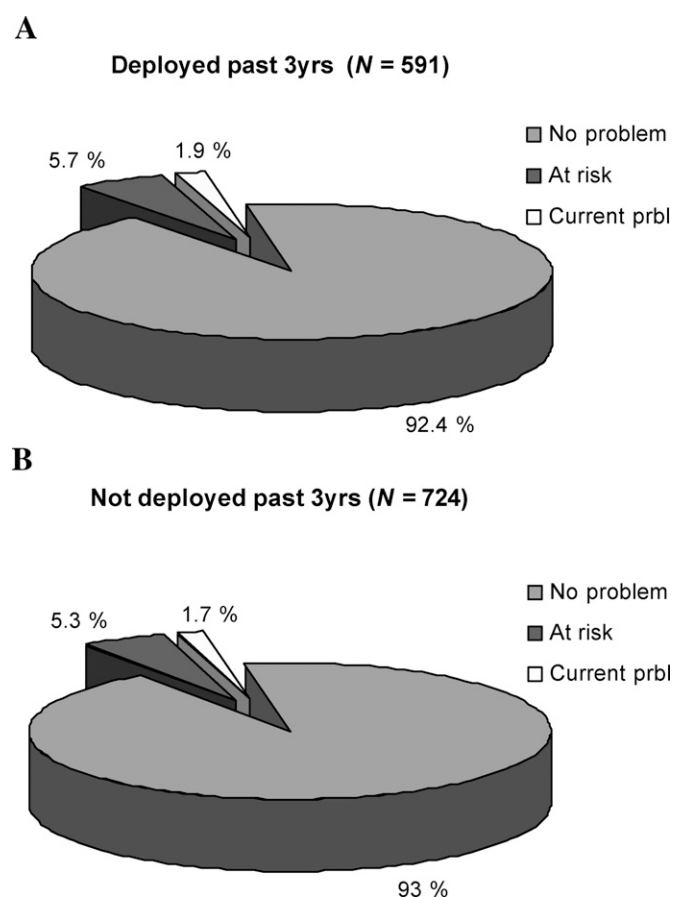
To evaluate the contribution of hardiness in predicting personnel at risk, a sequential logistic regression analysis was employed. Personal characteristics (age and sex) and length of deployment were entered in Step 1 and Step 2, respectively. Contrary to expectations, age was positively related to being at risk (Table II). That is, compared to the 50 years or older group, all other age groups were less likely to be at risk for abuse, with the youngest group (29 years or younger) having the least risk.

In Step 3, hardiness made a significant contribution in predicting personnel at risk. A one-point increase in hardiness was associated with an odds ratio (OR) of 0.92 or an 8% decrease in the odds of being at risk of abuse. Finally, avoidance coping entered in Step 4 was positively and statistically significantly related to risk (OR = 1.12, 12% increase in odds). When the three hardiness dimensions were entered in Step 3 instead of the total score, only challenge approached statistical significance (OR = 0.80,  $p = 0.06$ ) (results not shown in table). Entered in Step 4, avoidance coping was still significant in this analysis (OR = 1.12,  $p = 0.013$ ).

Next, we repeated the regressions including only personnel deployed during the last 3 years. In these analyses, we included the additional variables combat exposure and deprivation of basic needs. With the exception of hardiness, the same patterns emerged. Age and avoidance coping significantly predicted risk, but the coefficients for hardiness did not reach conventional levels of statistical significance. Neither combat exposure nor deprivation of basic needs significantly predicted risk. However, a significant interaction between the challenge dimension and deprivation of needs emerged (OR = 96,  $p = 0.02$ ). This interaction is illustrated in Figure 2 and shows that for personnel low in challenge, deprivation of basic needs was associated with increased risk of alcohol abuse.

### Predicting Current Alcohol Problems

To evaluate the contribution of hardiness in predicting personnel with current alcohol problems, two further sequential logistic regression models were computed. In the first model, current problems were regressed on age and sex (Step 1), length of deployment (Step 2), hardiness (Step 3), and avoidance coping (Step 4) in the sample as a whole. The only significant predictor to emerge in this analysis was avoidance coping,  $B = 0.20$ , OR = 1.22, Wald  $\chi^2(1) = 18.01$ , and  $p = 0.001$ . The next model repeated this regression in just the deployed sample. Again, the only significant predictor was avoidance coping,  $B = 0.21$ , OR = 1.23, Wald  $\chi^2(1) = 10.80$ , and  $p = 0.044$ . This indicates that for every one-point



**FIGURE 1.** Percentage distribution of alcohol patterns (no problem, at risk, current problem) in military personnel deployed and not deployed during the past 3 years.



**TABLE II.** Logistic Regression Predicting Likelihood of At Risk for Alcohol Problem ( $N = 1076$ )

Step	Variables	$B_{\text{Step 1}}$	$B_{\text{Step 2}}$	$B_{\text{Step 3}}$	$B_{\text{Step 4}}$	Final Model Estimates <sup>a</sup>		
						Wald Statistic	OR	95% CI
1	Sex	-0.51	-0.55	-0.49	-0.44	0.35	0.65	[0.15, 2.76]
	Age <sub>1</sub>	-1.04*	-1.20*	-1.21*	-1.33**	6.90**	0.27	[0.10, 0.71]
	Age <sub>2</sub>	-1.06**	-1.14**	-1.10**	-1.20**	8.69**	0.30	[0.14, 0.67]
	Age <sub>3</sub>	-0.91*	-0.94*	-0.91*	-0.95*	5.92*	0.39	[0.18, 0.83]
2	Deployment <sub>1</sub>		0.41	0.42	0.44	1.79	1.56	[0.81, 2.98]
	Deployment <sub>2</sub>		-0.07	-0.09	-0.12	0.09	0.88	[0.39, 2.01]
3	Hardiness			-0.08*	-0.08*	4.89*	0.92	[0.86, 0.99]
4	Avoidance Coping				0.11**	6.90**	1.12	[1.03, 1.21]
Pseudo $R^2$		0.02	0.027	0.04	0.06			
$\chi^2$		$\pm 7.987$	1.900	5.139*	6.748**			

B = unstandardized regression coefficient; CI = confidence interval; Age<sub>1</sub> = 29 years or younger; Age<sub>2</sub> = 30–39 years; Age<sub>3</sub> = 40–49 years. Ages 50 years or older is the reference category with which the other groups are compared. Deployment<sub>1</sub> = up to 6 months deployment during the last 3 years; Deployment<sub>2</sub> = more than 6 months deployment during the last 3 years. Not deployed during last 3 years is the reference category with which the other groups are compared. Men = 0; Women = 1. Final model  $\chi^2(8) = 21.774$ ,  $p = 0.005$ . \* $p < 0.05$ ; \*\* $p < 0.01$ ;  $\pm p < 0.10$ . <sup>a</sup>Estimates from the final step of the model (Step 4).

increase in avoidance coping scores, there is a 22% increase in the odds of having an alcohol problem in the sample as a whole and a 23% increase in the odds of having an alcohol problem in the deployed sample.

## DISCUSSION

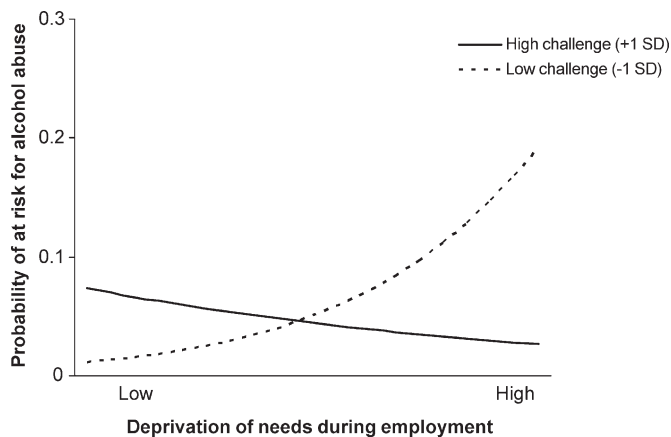
As with other high stress, high-risk occupations, military and defense workers are at increased risk for alcohol and substance abuse because of the stressful nature of the job. The current study set out to identify novel factors associated with high levels of alcohol use in defense workers.

Results confirm that as predicted, being low in psychological hardiness increases the risk of alcohol abuse. Logistic regression results show that for every one-point increase in hardiness scores, there is a concomitant 8% decrease in the odds for alcohol abuse. These results obtained after controlling for any effects of age and sex. Also as predicted, avoidance coping style, which is commonly seen in low-hardiness

individuals, is independently associated with alcohol abuse risk. With every one-point increase in avoidance coping scores, there is an 11% increase in the odds for alcohol abuse.

These effects pertain for the entire sample and are not significantly influenced by recent deployment experience (over the previous 3 years). However, whether deployed or not, the job of a defense worker in most cases involves considerable stress. Defense workers generally work long hours, and in some respects are never “off-duty” even when not officially working. As Goffman<sup>42</sup> has argued, the military is a “total institution” in which the boundaries between work, family, and play are blurred. Many defense workers are subject to be called back to work at any time, should the national defense situation warrant it. There is often less liberty or freedom of choice in defense jobs, where project activities can be highly regimented and must follow strict time schedules.

Defense workers may be required to move to new duty stations multiple times over a career. Add to this the stress of recent cuts in national defense spending, which can mean pay and benefits reductions. So even without deploying out of country, the job is a stressful one and can lead some to use avoidance coping strategies such as alcohol abuse. This interpretation is consistent with our finding that older defense workers, those who have been on the job longer and so have higher levels of cumulative stress, are also at higher risk for alcohol abuse. Regarding the increased risk with age, it is also possible that the CAGE instrument is more sensitive in detecting alcohol problems in older as compared to younger subjects. This could happen, for example, if older people are more inclined to agree with particular CAGE questions, such as “have you ever felt annoyed by criticism of your drinking.” Older people also may be more likely to have a significant other who tells them to cut down on their drinking. On the other hand, younger people are perhaps more prone to binge drinking, often socializing with others who also drink



**FIGURE 2.** Interaction between the challenge dimensions of hardiness and personal/basal needs during deployment predicting personnel at risk for alcohol abuse.

more and so are less likely to express criticism for drinking too much. In fact, the CAGE instrument has been shown to lack sensitivity in younger age groups.<sup>43</sup>

In examining the effects of hardiness on alcohol abuse more closely, our findings revealed that none of the three hardiness facets individually predicted alcohol abuse risk; challenge, however, approached conventional levels of significance with a *p* value of 0.06. Future research should make use of Structural Equation Modeling techniques to evaluate several possible models suggested by the present work, including one in which the effects of hardiness on alcohol abuse risk are mediated by avoidance coping approaches.

When the analyses were restricted only to those respondents who had deployed out of country at some time during the previous 3 years, hardiness—challenge was seen to interact with the basic needs variable in predicting alcohol abuse. As Figure 2 reveals, under the more difficult deployment conditions in which basic needs or comforts are lacking, those who are low in hardiness—challenge are at elevated risk for alcohol abuse, whereas those high in challenge appear to be protected. This finding is consistent with the hypothesis that psychological hardiness functions as a stress buffer.<sup>8,10</sup> In the present sample, there were very few individuals reporting combat-related deployment stressors, such as being shot at. Thus, a “restricted range” problem with the combat exposure variable could account for why this did not show any significant effect.

The “deprivation of basic needs” variable indexes deployments that are more taxing and uncomfortable for the individuals involved, particularly as regards lack of needed rest. Thus, a good test of the hardiness stress-buffering hypothesis in the present sample can be made by using the basic needs variable as a deployment stress measure. Here, our results suggest that the hardiness challenge dimension is most important in providing military and defense personnel with some protection against the ill-effects of deployment-related stress, and that those who are low in challenge (and thus more insecure in dealing with change and uncertainty<sup>6</sup>) are also more likely to slip into alcohol abuse as an avoidance coping strategy when they come home. Interestingly, Eid and Morgan<sup>44</sup> earlier found that those low in hardiness challenge were also more likely to experience symptoms of mental dissociation following traumatic stress exposure. It is well known that peritraumatic dissociation is associated with PTSD.<sup>45,46</sup> Alcohol abuse is also often comorbid with a range of anxiety disorders, including PTSD.<sup>47</sup> Thus, low-hardiness challenge may serve as an early marker for PTSD risk, as well as stress-related alcohol or substance abuse. Other studies have in fact shown that psychological hardiness is associated with fewer PTSD symptoms following combat exposure.<sup>18,19</sup>

One important implication of the current study concerns the possible use of hardiness scores to help identify military personnel at risk for alcohol problems. Current alcohol screening approaches in the military rely upon direct measures, asking about current and recent drinking behavior.

Such direct measures are not sufficiently sensitive since troops likely under-report substance abuse problems for fear of reprisal; and even for those admitting problems, very few get referred for help.<sup>48</sup> More effective screening techniques are needed to identify early those troops most likely to fall into alcohol and drug abuse patterns after returning home. If more effective screening tools were available, the highest-risk subgroups could be targeted for focused support and prevention efforts, including brief interventions that could be structured so as to avoid the stigma associated under current policy with referral to formal military substance abuse programs. For example, Montiet al<sup>49</sup> describe a number of very brief interventions used successfully with young adult problem drinkers in a variety of settings. But these authors also point out that young problem drinkers tend not to see themselves as such and often are identified only when they get into some kind of trouble with the law (e.g., drunk driving) or are seen in an emergency room. In the U.S. military, it is the youngest age group (18–25 year olds) that is at highest risk for heavy drinking.<sup>4,5</sup> This suggests the need for indirect screening methods to identify redeploying soldiers who are at higher risk for alcohol or substance abuse, but who may not recognize this in themselves or be willing to admit it openly. Given the present findings showing a clear association between low psychological hardiness and problem drinking, hardiness scores could provide a valuable adjunct to existing alcohol screening tools in military groups.

This study has several limitations that should be mentioned. One is that alcohol use was measured cross-sectionally, and we therefore have no information on potential increases in alcohol consumption over time. It would thus be important and desirable for future research to follow a longitudinal design, assessing the potential influence of variables such as psychological hardiness and avoidance coping on actual changes or increases in subsequent alcohol consumption that may be stress-related. At the same time, the present significant findings were obtained with a substantial sample (*N* = 1,315) of respondents, suggesting that results are robust and at least provide important leads for future prospective research to evaluate.

Another potential limitation is that the present study relies upon self-report, assuming that respondents will answer questions honestly and accurately. For multiple reasons including self-enhancement bias and social desirability, individuals may provide untrue responses to survey questions, especially when the questions concern socially sensitive issues such as alcohol use or abuse.<sup>50</sup> Future research in this area should seek to control for potentially confounding influences like social desirability.<sup>51</sup>

A third limitation is that apart from some specific survey questions aimed at respondents with recent deployment experience, this research did not specifically aim to assess sources and extent of job-related stress for military and defense workers. It would be beneficial for future studies with this

occupational group to have more direct indicators regarding on-the-job stress.

Finally, these data and findings may not be generalizable to other populations, including military groups outside of Norway. Each country and military organization is in some ways unique, and special factors may be at work within the Norwegian military organization that do not apply elsewhere. Given this possibility, caution is recommended when generalizing these findings to other groups.

Despite these limitations, the present study provides important findings of high relevance to the challenge of preventing stress-related substance abuse. Results show that individuals who are low in psychological hardiness and high in avoidance coping tendencies are at significantly higher risk for alcohol problems. In addition, defense workers who are older (50 years or greater) also are at higher risk. Although additional research is needed to confirm these results, the present study provides an important advance in identifying military workers at higher risk for alcohol and substance abuse. With more effective screening approaches, high-risk subgroups could be targeted for focused support and prevention efforts. Improved screening approaches in this area will benefit not only the military, but also other occupations that routinely place workers in high-risk, high stress environments.

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